

JOHNSON ET AL. - 10/621,464  
Client/Matter: 071469-0304543

### REMARKS

Claims 1, 15, 26, 34, 35, and 36 are amended hereby. Claim 3 is canceled. No new claims are added. Accordingly, after entry of this Amendment, claims 1-2 and 4-36 will remain pending.

In the final Office Action dated April 5, 2006, the Examiner rejected claims 1, 2, 10-14, and 34 under 35 U.S.C. § 102(b) as being anticipated by Kagatsume et al. (U.S. Patent No. 4,908,095). Claims 7, 15-17, 35, and 36 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Kagatsume et al. In addition, the Examiner rejected claims 7 and 20-25 under 35 U.S.C. § 103(a) as being unpatentable over Kagatsume et al. in view of Rossmann et al. (U.S. Patent No. 6,077,357). Next, claims 8 and 9 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Kagatsume et al. in view of Wang et al. (U.S. Patent No. 6,537,011). Finally, the Examiner rejected claims 3-6, 18, 19, and 26-33 under 35 U.S.C. § 103(a) as being unpatentable over Kagatsume et al. in view of Rossmann et al. and Barnes et al. (U.S. Patent No. 6,776,170). The Applicant respectfully disagrees with each of the rejections and, therefore, respectfully traverses the same.

Before addressing the rejections asserted by the Examiner, the Applicant respectfully refers the Examiner to Footnote #1 in the Amendment filed on January 23, 2006. In that footnote, the Applicant respectfully pointed out that Barnes et al. is not officially of record in this application. In that footnote, the Applicant respectfully stated:

"In the Office Action, the Examiner listed Barnes et al. as the patent with which this rejection is fashioned. However, U.S. Patent No. 6,776,170 is issued to Liu. Moreover, there is not patent issued to Barnes et al. that is currently of record. Accordingly, the Applicant respectfully responds to the rejection based on Liu."

The Examiner appears to be relying, in this Office Action on Liu but has, once again, referred to the reference as Barnes et al. The Applicant respectfully requests that the Examiner clarify if there is, in fact, another reference upon which the Examiner is relying to reject the claims. If so, the Applicant respectfully requests that the Examiner withdraw the finality of this Office Action, identify the Barnes et al. reference by its patent number, and permit the Applicant to address the rejection based on the Barnes et al. reference. As before, the Applicant is treating the rejection as though it is based on Liu, since there is no Barnes et al. reference that has been made of record at this point in prosecution.

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The Applicant respectfully submits that claims 1-2, 4-25, and 35-36 are patentably distinguishable over the references cited by the Examiner because the claims recite a vertically translatable chuck assembly or a plasma reactor system for processing a workpiece that combines a number of features including, among them, a match network having at least a portion, comprising a first variable capacitor, mounted to said workpiece support member lower surface, within said chuck assembly, so as to be in direct electrical communication with said workpiece support member lower surface. This feature, in modified format, was formerly recited by claim 3, which has now been canceled. The Applicant respectfully submits that none of the references, either alone or in combination, describe or suggest a vertically translatable chuck assembly or a plasma reactor system for processing a workpiece that combines features including at least this feature. Accordingly, the Applicant respectfully submits that the Examiner's rejections cannot be maintained. As a result, the Applicant respectfully requests that the Examiner withdraw the rejections of the claims and pass this application quickly to issuance.

The Applicant respectfully submits that Kagatsume et al. fails to describe or suggest a match network having at least a portion, comprising a first variable capacitor, mounted to said workpiece support member lower surface, within said chuck assembly, so as to be in direct electrical communication with said workpiece support member lower surface. In support of this conclusion, the Applicant respectfully submits that there is no discussion in Kagatsume et al. of a match network of any kind, let alone one as recited in claims 1-2, 4-25, and 35-36. Accordingly, the Applicant respectfully submits that Kagatsume et al. cannot be relied upon to anticipate or render obvious any of claims 1-2, 4-25 or 35-36.

Rossman et al. also does not describe or suggest an apparatus that combines features including a match network having at least a portion, comprising a first variable capacitor, mounted to said workpiece support member lower surface, within said chuck assembly, so as to be in direct electrical communication with said workpiece support member lower surface. To the contrary, Rossman et al. describes three separate local RF match configurations as illustrated in Figs. 2A, 2B and 2C. (Rossman et al. at col. 6, lines 14-27.) (NOTE: Fig. 3C in Rossman et al. should probably be labeled as "2C.") There is no discussion, however, of mounting a portion of a match network within the chuck assembly. Moreover, as would have been common practice, those skilled in the art would have thought to locate the match network outside of the processing chamber.

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In addition, Wang et al. does not describe or suggest an apparatus that combines a number of features including, among them, a match network having at least a portion, comprising a first variable capacitor, mounted to said workpiece support member lower surface, within said chuck assembly, so as to be in direct electrical communication with said workpiece support member lower surface. In fact, there is no discussion of the details of the match network in Wang et al. As a result, there is nothing in Wang et al. upon which the Examiner might rely to assist with a rejection of the claims.

Liu also does not assist the Examiner with a rejection of claims 1-2, 4-25, and 35-36. While Liu describes two match networks MN1 and MN2, neither of the match networks include any portion mounted within the workpiece support 40. (Liu at Fig. 1, for example.) There is no additional discussion of the structure of either of the match networks MN1 or MN2.

The Applicant respectfully submits, therefore, that the references relied upon by the Examiner are wholly inappropriate as a basis for anticipating or rendering obvious any of claims 1-2, 4-25, or 35-36. Accordingly, the Applicant respectfully requests that the Examiner withdraw the rejections with respect to these claims.

Claims 26-28 recite a match network that combines a number of features including among them, a first variable capacitor mounted to said workpiece support member lower surface so as to be in direct electrical contact therewith, and a first inductor arranged adjacent said first variable capacitor within the chuck assembly and in electrical communication with said first variable capacitor. As discussed above in connection with claims 1-2, 4-25, and 35-36, none of the references describes or suggests a match network where a first variable capacitor is mounted to the workpiece support member lower surface to be in direct electrical contact therewith. In addition, none of the references describes or suggests a first inductor arranged adjacent to the first variable capacitor within the chuck assembly. For this additional reason, therefore, the Applicant respectfully submits that claims 26-28 are patentable over the references of record. Accordingly, the Applicant respectfully requests that the Examiner reconsider the rejection of claims 26-28 and pass this application quickly to issuance.

Claims 29-33 are patentably distinguishable over the references cited by the Examiner because they recite, among other things, a method of providing a low impedance path between an RF power supply and a workpiece support member that includes mounting a first variable capacitor to a workpiece support member lower surface so as to be in direct

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electrical contact therewith and tuning a match network to match the impedance load of the plasma so as to minimize the impedance between the RF power supply and the workpiece support member. None of the references relied upon by the Examiner describe or suggest such a combination of features. As a result, the Applicant respectfully submits that none of the references may be relied upon to render claims 29-33 obvious.

Kagatsume et al. describes an etching method, which is described in connection with Fig. 10. (Kagatsume et al. at col. 7, lines 43-45.) While a reaction gas is being supplied, a high-frequency current with a frequency of 13.56 MHz is applied from a high frequency power source 47. (Kagatsume et al. at col. 8, line 65, through col. 9, line 3.) There is, however, no discussion at least of a method of providing a low impedance path between an RF power supply and a workpiece support member that includes mounting a first variable capacitor to a workpiece support member lower surface so as to be in direct electrical contact therewith and tuning a match network to match the impedance load of the plasma so as to minimize the impedance between the RF power supply and the workpiece support member. Accordingly, the Applicant respectfully submits that Kagatsume et al. is insufficient to act as a base upon which a rejection of claims 29-33 may be fashioned.

The Applicant respectfully submits that Rossman et al. does not cure the deficiencies noted with respect to Kagatsume et al. Rossman et al. describes an orientless wafer processing on an electrostatic chuck with one of three separate RF match configurations illustrated in Figs. 2(a)-2(c). (Rossman et al. at col. 6, lines 14-15.) The match configurations are for use with a coil L, such as the top coil 72 and the side coil 74. (Rossman et al. at col. 6, lines 14-30.) Nowhere does Rossman et al. describe or suggest a method of providing a low impedance path between an RF power supply and a workpiece support member that includes mounting a first variable capacitor to a workpiece support member lower surface so as to be in direct electrical contact therewith and tuning a match network to match the impedance load of the plasma so as to minimize the impedance between the RF power supply and the workpiece support member. Accordingly, the Applicant respectfully submits that Rossman et al. cannot be combined properly with Kagatsume et al. to reject claims 29-33.

Liu also does not cure the deficiencies noted with respect to Kagatsume et al. Liu describes a method and apparatus for plasma cleaning of workpieces. According to Liu, a plasma cleaning system 12 includes a cleaning chamber 20. (Liu at col. 3, lines 13-17.) There is, however, no discussion of providing a low impedance path between an RF power

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supply and a workpiece support member that includes mounting a first variable capacitor to a workpiece support member lower surface so as to be in direct electrical contact therewith and tuning a match network to match the impedance load of the plasma so as to minimize the impedance between the RF power supply and the workpiece support member. Accordingly, the Applicant respectfully submits that Liu cannot be combined properly with Kagatsume et al. to reject claims 29-33.

Claim 34 is patentably distinguishable over Kagatsume et al. because claim 34 describes a method of providing for uniform, substantially axially symmetric flow of plasma gas over a workpiece in a plasma reactor chamber having a central axis and capable of containing a plasma in an upper interior region of the chamber. The method includes, among other features, connecting a match network to the chuck assembly, wherein the match network has at least a portion, comprising a first variable capacitor, mounted to a lower surface of a workpiece support member, within said chuck assembly, so as to be in direct electrical communication with said workpiece support member lower surface. Kagatsume et al. does not describe such combination including at least this feature. Accordingly, the Applicant respectfully submits that Kagatsume et al. cannot anticipate claim 34. Kagatsume et al. is discussed above. Accordingly, further discussion of Kagatsume et al. is not provided here.

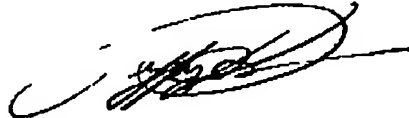
Each of the rejections having been addressed, the Applicant respectfully requests that the Examiner withdraw the rejections of the claims and pass this application quickly to issuance.

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Respectfully submitted,

PILLSBURY WINTHROP SHAW PITTMAN LLP



JEFFREY D. KARCESKI  
Reg. No. 35914  
Tel. No. 202.663.8403  
Fax No. 202.663.8007  
Customer No.: 00909

Date: August 17, 2006  
P.O. Box 10500  
McLean, VA 22102  
(703) 905-2000